THE INVENTION CLAIMED IS:

1. A composite tube suitable for ethylene pyrolysis furnaces and like service comprising an outer shell of a Fe-Ni-Cr heat resistant alloy and an inner core of alloy MA956.

2. The composite tube of claim 1, wherein the Fe-Ni-Cr heat resistant alloy of the outer shell is a high temperature heat-resistant alloy selected from the group consisting of alloys 800HT, 803, 890, HK40, HPM and modified HPM.

3. The composite tube of claim 1, wherein the outer shell is made from a wrought Fe-Ni-Cr heat resistant alloy and the inner core of alloy MA956 is made from a mechanically alloyed powder wherein said outer shell and said inner core are simultaneously extruded.

4. The composite tube of claim 3, wherein the Fe-Ni-Cr heat resistant alloy of the outer shell is one selected from the group consisting of alloys 800HT, 803 and 890.

5. The composite tube of claim 1, wherein said inner core has a smooth bore.

6. The composite tube of claim 1, wherein said inner core has a finned bore.

7. A process of making a composite tube suitable for use in ethylene pyrolysis furnaces and like service comprising the steps of:

(a) providing an outer shell of a Fe-Ni-Cr heat resistant alloy;

(b) providing a mechanically alloyed powder of alloy MA956;

(c) placing the alloy MA956 powder of step (b) around an inner diameter of said outer shell provided in step (a) to form an inner core, wherein the inner core has a bore formed therein;

(d) simultaneously extruding the outer shell and inner core to form an extruded composite tube shell; and

(e) cold working the composite tube shell to form the composite tube.

8. The process of claim 7, including the step of degassing the alloy powder under a vacuum after said placing step (c) and including the step of heating said outer shell and inner layer prior to said co-extruding step (d) to a temperature less than 1200°C and maintaining time and temperature to prevent recrystallization of said alloy MA956.

9. The process of claim 7, wherein the cold working step includes one of the steps of drawing or pilgering.

10. The process of claim 9, wherein the step of drawing is selected to produce a finned inner diameter.

11. The process of claim 8, wherein said alloy MA956 exhibits a coarse-grained microstructure and wherein said heating step is conducted at a temperature of 1177°C-1190°C and further wherein the process is conducted at times and temperatures less than 2000°C to prevent a recrystallization of coarse-grained microstructure of the alloy MA956 to a fine-grained microstructure.

12. A method of field fabricating ethylene pyrolysis furnace tubes comprising the steps of:

(a) providing composite tubes comprising an outer shell of a Fe-Ni-Cr alloy and an inner core of alloy MA956;

(b) heating the composite tubes to a temperature of at least 80°C;

(c) bending the heated composite tubes to a desired configuration to provide formed composite tubes; and

(d) joining the formed composite tubes by welding while said formed composite tubes are at a temperature the same as or in excess of the temperature of step (b), said welding step employed in one or more welding passes using a first weld filler metal compatible with the alloy of said inner core and successive welding passes using a filler metal compatible with the alloy of said outer shell.

13. The method of claim 12, wherein said first weld filler metal is filler metal MA956 alloy wire and said second filler metal is filler metal 617 alloy wire.

14. The method of claim 13, wherein the composite tubes are heated to a temperature of 205°C prior to said welding step and further includes post-weld heat treating the welded composite tubes at a temperature of 205°C.

15. The method of claim 14, wherein the welding step employs a torch electrode of tungsten with an inert shielding gas of pure argon.

16. An extruded and cold worked composite tube having an outer shell of a wrought or cast alloy and an inner core of an oxide dispersion strengthened powder metal alloy.

17. The composite tube of claim 16, wherein the outer shell is a wrought Fe-Ni-Cr alloy.

18. The composite tube of claim 17, wherein the wrought Fe-Ni-Cr alloy is one selected from the group consisting of alloys 800HT, 803 and 890.

19. The composite tube of claim 17, wherein the powder metal alloy is alloy MA956.

20. An ethylene pyrolysis furnace tube comprising an extruded and drawn composite tube having an outer shell of a Fe-Ni-Cr alloy and an inner core of alloy MA956.

21. The ethylene pyrolysis furnace tube of claim 20, wherein the inner core has a bore with a finned sidewall.

22. The ethylene pyrolysis furnace tube of claim 20, wherein the Fe-Ni-Cr alloy is one selected from the group consisting of alloys 800HT, 803, and 890.

23. An ethylene pyrolysis furnace tube comprising an extruded and pilgered composite tube having an outer shell of a Fe-Ni-Cr alloy and an inner core of alloy MA956.

24. The ethylene pyrolysis furnace tube of claim 23, wherein the Fe-Ni-Cr alloy is one selected from the group consisting of alloys 800HT, 803, and 890.